School of Energy Resources: Administration of the ITC, CarbonSAFE and MTR Update

Prepared for
Wyoming Legislature
Minerals, Business &
Economic Development Committee

May 19, 2023

THE WORLD NEEDS MORE COWBOYS.

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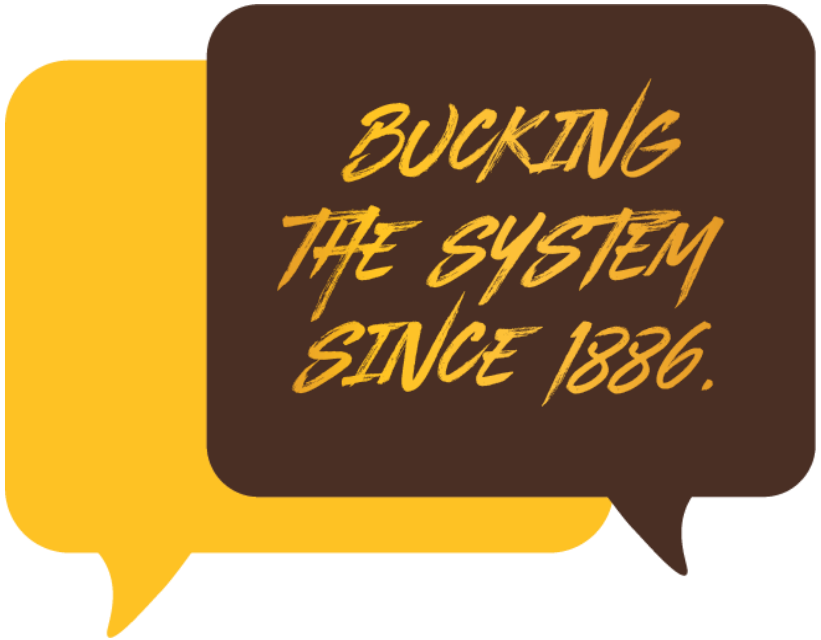
SER's Mission:

Energy-driven economic development for Wyoming



SER Research Structure

Center of Economic Geology Research

Center of Carbon Capture and Conversion

Center for Energy Regulation and Policy Analysis

3D Visualization Center

Hydrogen Energy Research Center

Staff-led Centers of Excellence





Faculty-led Centers of Excellence

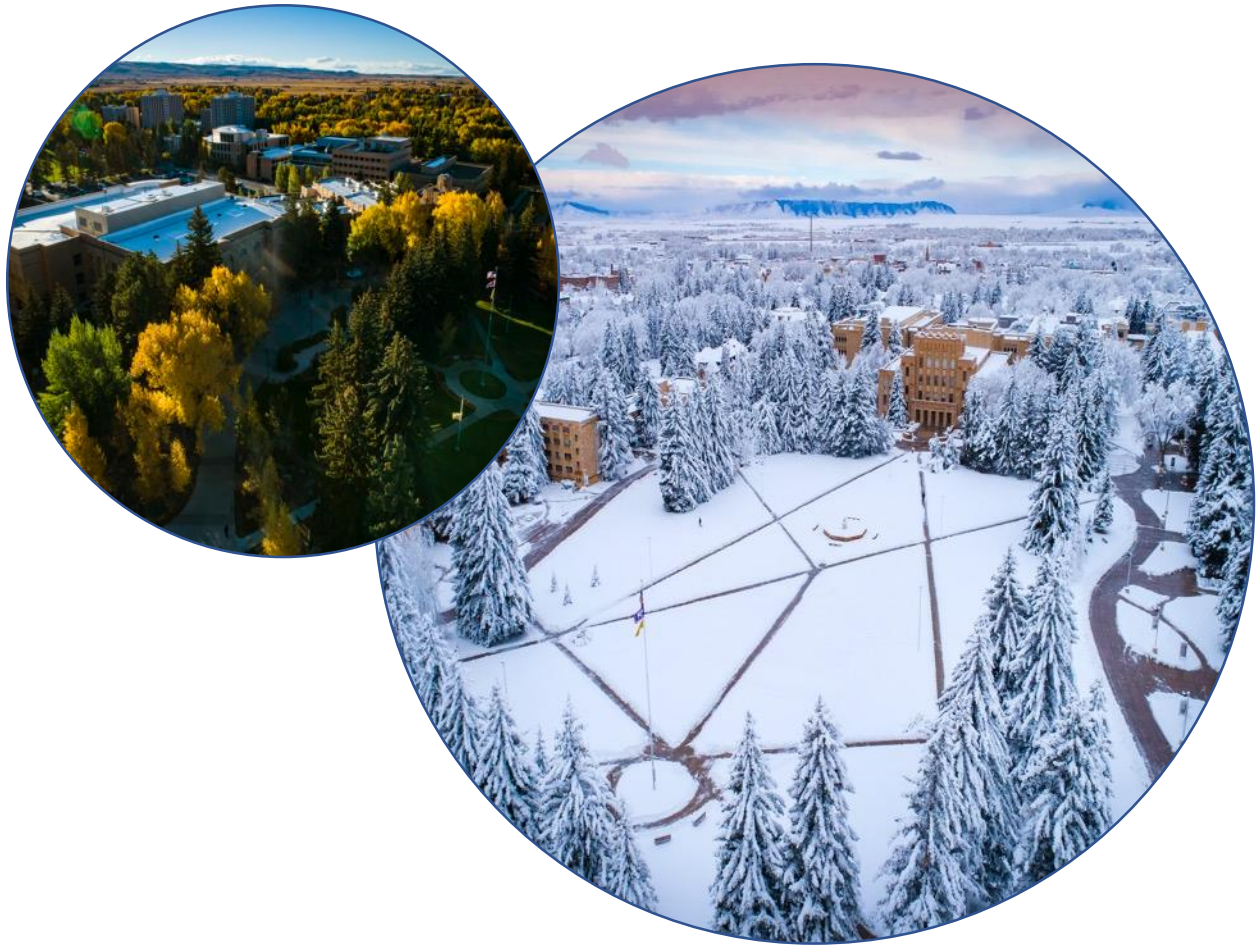
- Center for Air Quality
- Center for Produced Water Management
- Center for Biogenic Natural Gas Research
- Center for Wind Energy Research
- Nuclear Energy Research Center

Partner Organization

- Enhanced Oil Recovery Institute

Select Research Topics

- Carbon engineering (coal to products)
- Carbon capture, use and storage
- Oil and gas production
- Visualization
- Methane detection
- Rare earth elements and critical minerals
- Coal markets and sales
- Combustion
- Energy policy and economics
- Hydrogen
- Nuclear
- Produced water management
- Applied geologic research
- CO_2 in concrete



ITC

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ITC
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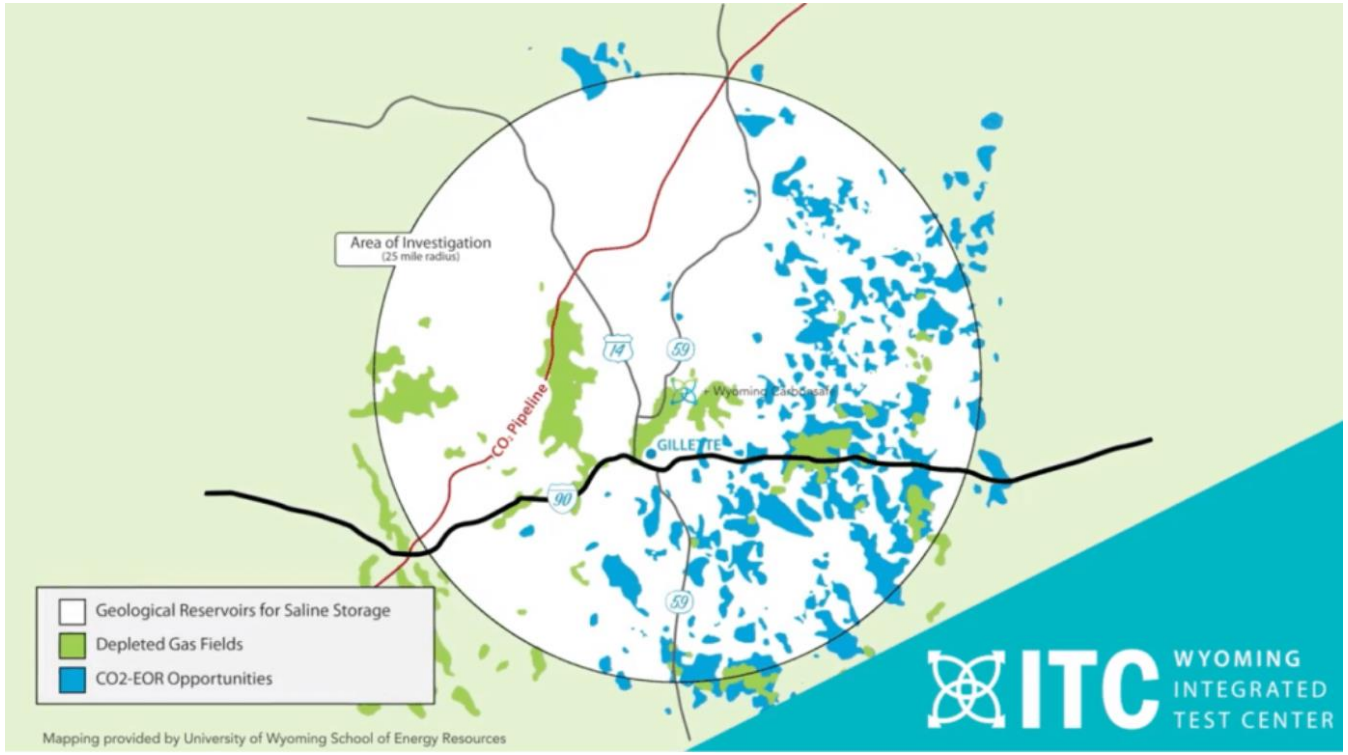
TEST CENTER

Wyoming Integrated Test Center

Original Support:
- State of Wyoming: $15 million
- Tri-State Generation and Transmission: $5 million
- NRECA: $1 million
- **Total: $21 million**

Current Funds (January 31, 2023):
- Cash on hand: $1.64 million
- CDs and security deposits: $3.24 million
- **Total: $4.855 million**

Obligations:
- Site reclamation: $706k



Tenant Overview

- **MTR** currently scheduled to begin construction in June 2023, testing in 2024
- **GTI** planning on construction in 2024 testing into 2025.
- **KHI** commenced construction on May 4th 2023.
  - Testing is planned for November – December 2023.
  - Will seek MOE funding for continuous testing through 2024.
  - Next phase would be 400-500 ton per day system.
- **TDA** will sign multi-year lease to conduct array of CO2 capture tests.
- **GreenOre** is testing Wyoming fly ash. Japan is proposing an ITC test.
- **CSU-UW** algae system - TBD.

ITC
WYOMING
INTEGRATED
TEST CENTER

Wyoming ITC: Forward Management

Management approach

- Ensure a smooth transition
- Contracts
  - Lease with Basin Electric and tenant subleases with Governor's Office
  - Service contracts with UW SER
- Financials – leave finances with WEA and provide quarterly invoices
- Formalize approach with an MOU

Approach and potential funding needs

- If the ITC continues on its current path, available funds are likely sufficient
- Pursue opportunities for federal funds when applicable
- Support tenant recruitment and pursue other opportunities in collaboration with Basin Electric
- Build out a robust plan for maximum impact

CarbonSAFE

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CarbonSAFE Background

CarbonSAFE Program:

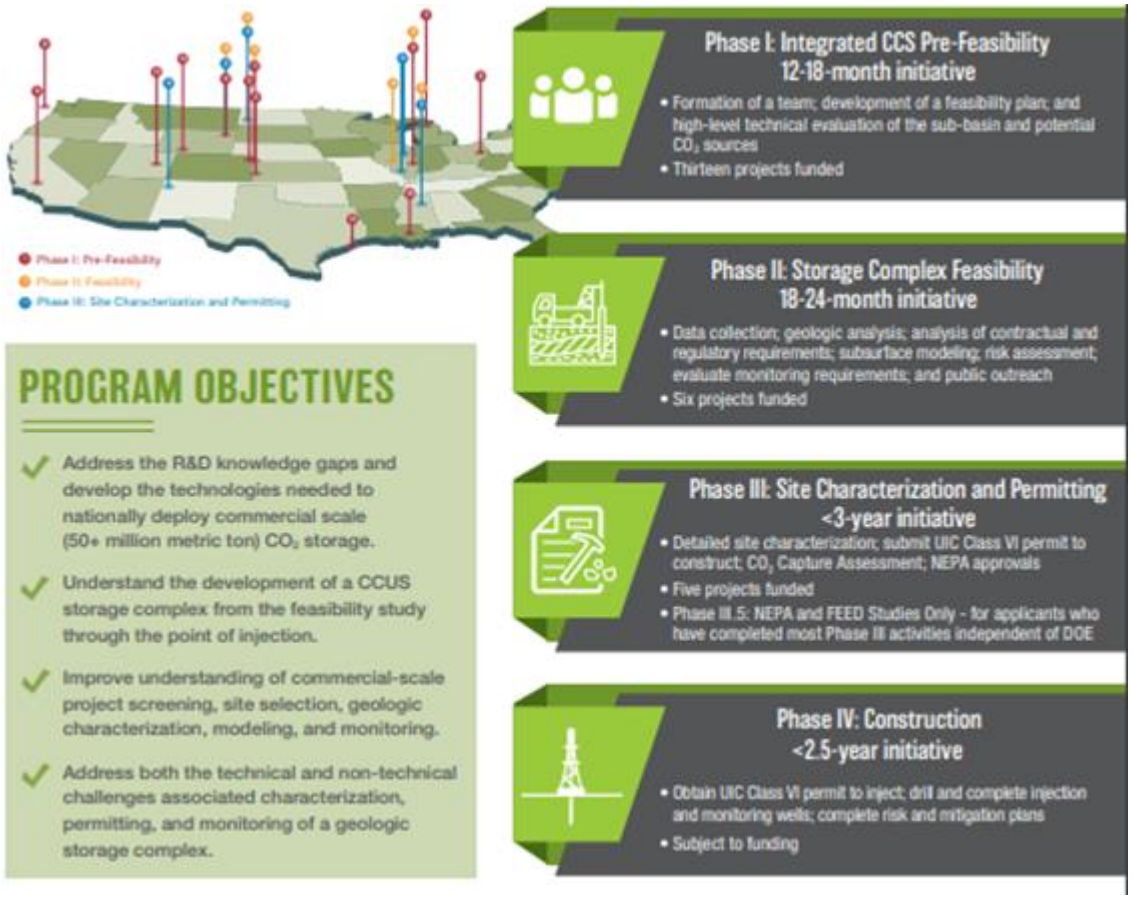
S = Storage

A = Assurance

F = Facility

E = Enterprise

- Program led by Department of Energy, National Energy Technology Laboratory (Fossil Fuel Focused National Lab)
- Focused on ensuring carbon storage complexes will be ready for geologic CO_2 storage by 2025-2030
- Applied research program at large scale



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SER is leading two active CarbonSAFE projects with one proposal pending.

Project Overview: Wyoming CarbonSAFE Phase III

- Dry Fork Station (Basin Electric Power Coop)
- Wyoming Integrated Test Center (WY-ITC)

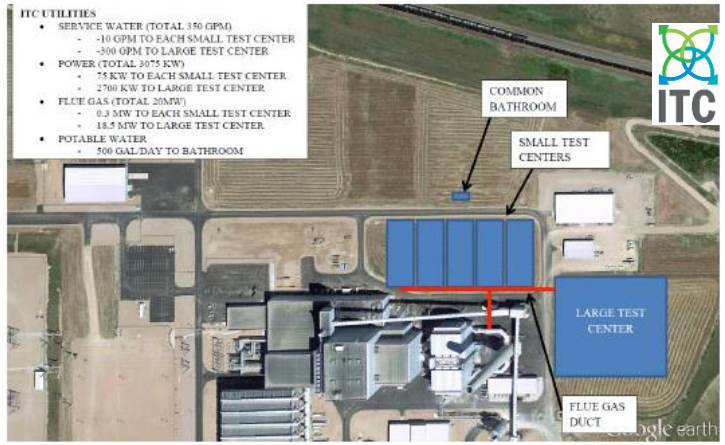
BASIN ELECTRIC POWER COOPERATIVE
A Touchstone Energy® Cooperative

Dry Fork Station:

- Near Gillette
- Built in 2007
- Operating life to 2072
- 385 MW
- 3.3 million tons of CO_2/year

Wyoming CarbonSAFE:

- In Phase III
- Current Phase is $19.5 million
- Two wells completed



WYOMING INTEGRATED TEST CENTER

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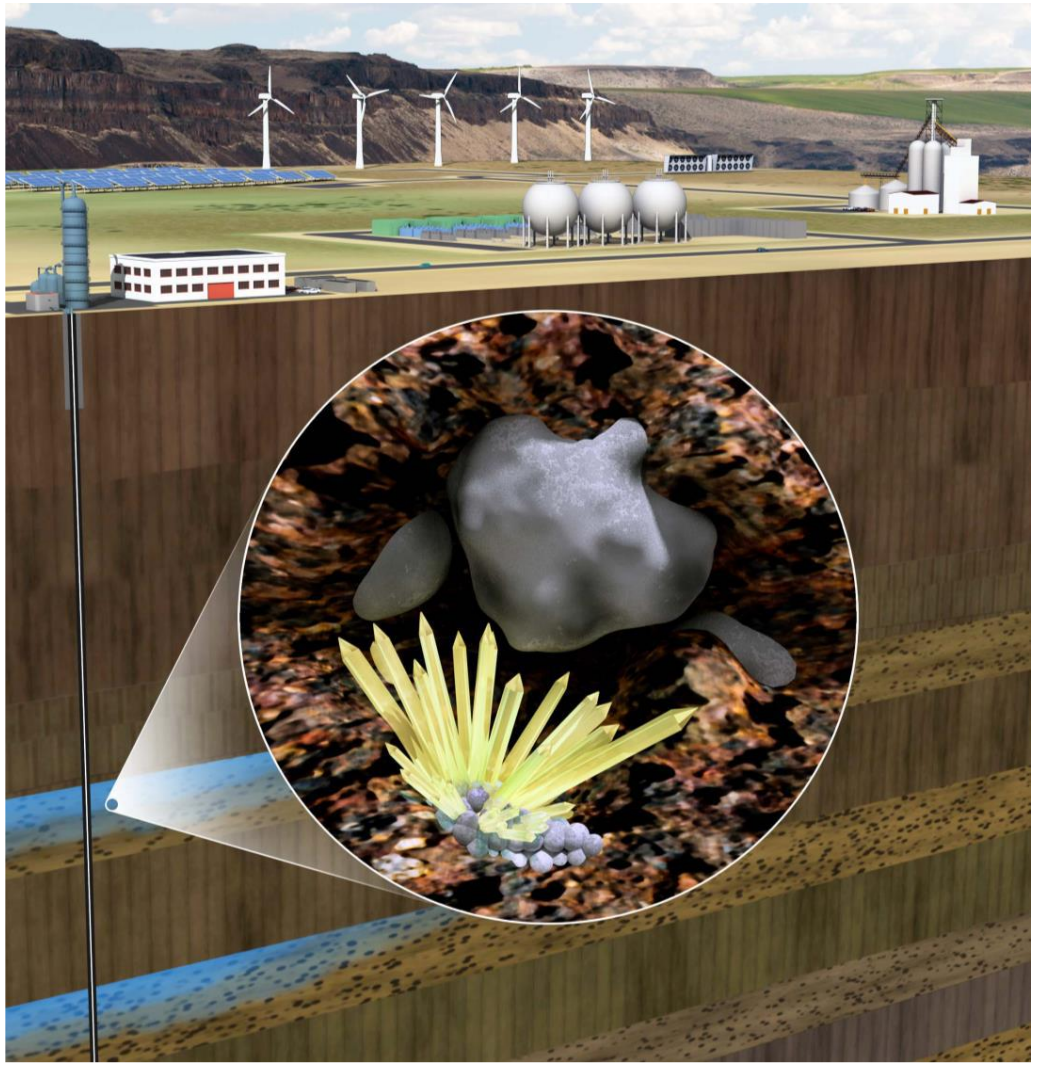
HERO Basalt CarbonSAFE (Hermiston Oregon Carbon Storage Assurance Facility Enterprise); CarbonSAFE Phase II

Project Summary: HERO Basalt CarbonSAFE will accelerate scale-up and deployment of commercial CO_2 capture and storage (CCS) projects in basaltic rocks—the largest potential CO_2 storage resource in the Pacific Northwest (PNW).

Duration and Award: 2 years, $10,524,930 project total award ($1,118,759 to SER)

Project Leads: SER, Oxy Low Carbon Ventures, Pacific Northwest National Laboratory and Calpine, along with Carbix and Schlumberger



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MTR

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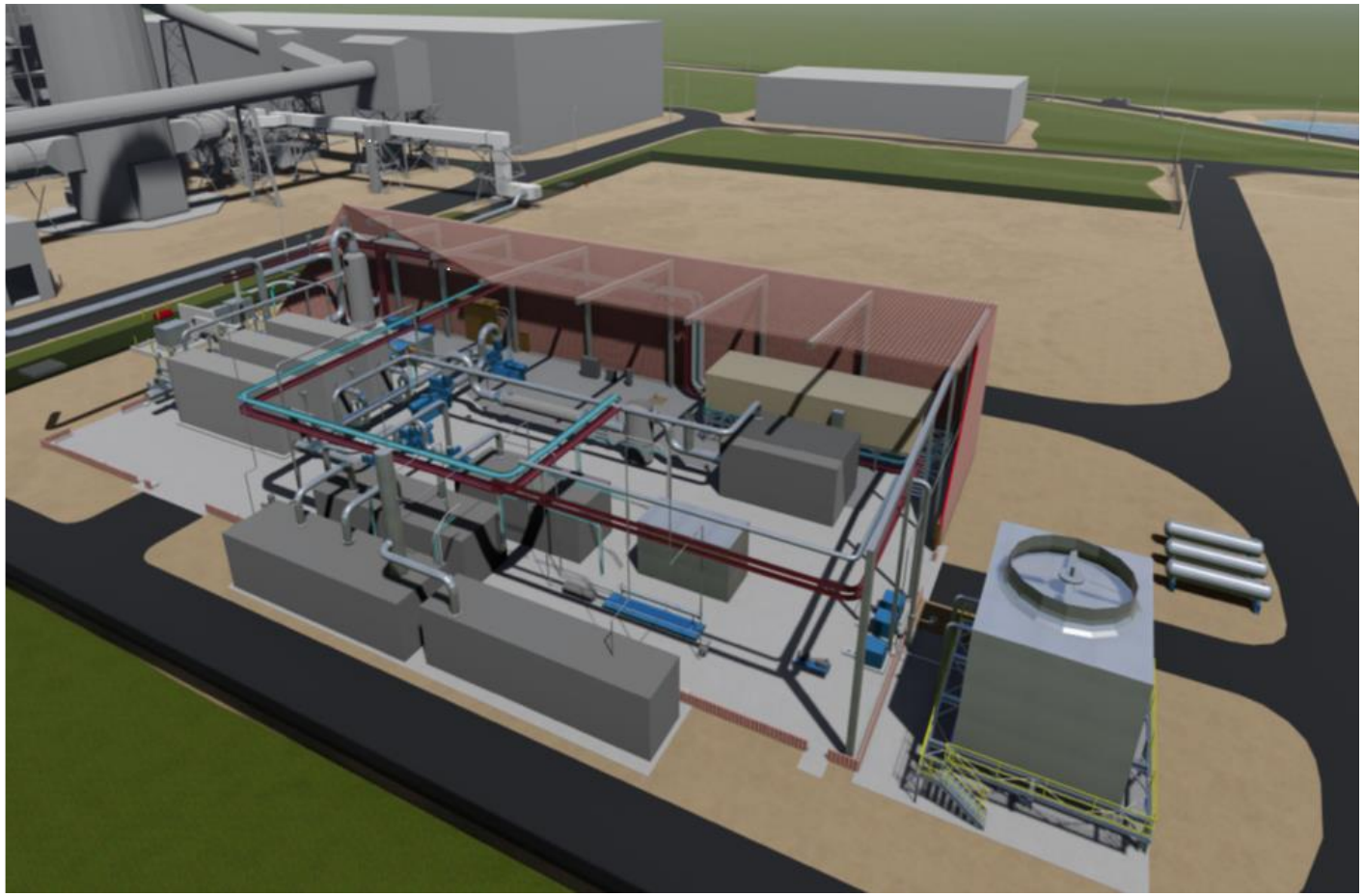
Membrane Technology and Research

MTR:

- Has developed a post-combustion capture technology
- First large-scale pilot tenant at the ITC (10 MW_e flue gas)
- FEED study underway
- Collaborating with Wyoming CarbonSAFE
- UW and MTR submitted a proposal for a commercial demonstration – under review by DOE



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